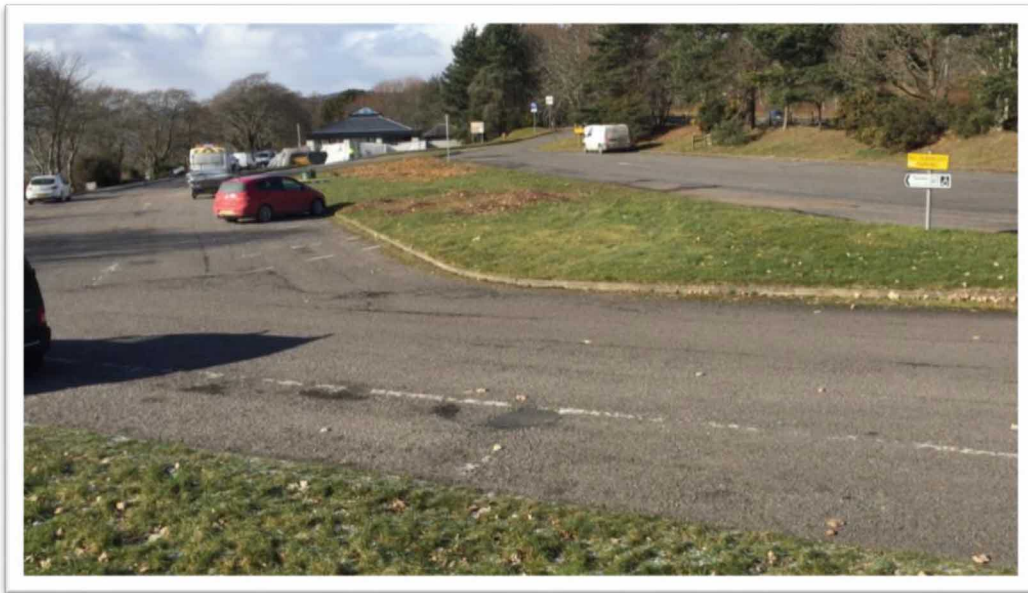


A Feasibility Study for the Installation of Motorhome Service Points and overnight parking facilities at the North Kessock Layby (A9 Northbound)

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Executive Summary:

The North Kessock layby appears to be well suited for development as a motorhome stop-over and service point. It is already established as a parking area, and this use could be extended to include overnight parking and water / wastewater services without the need for planning permission (although any development of the site resulting in loss of green space or trees would require planning approval).

The report recommends that professional engineering design work is carried out for the following reasons:

- To determine the optimum location for a service point with regard to safe access and connections to the existing utility services.
- To ensure the correct traffic safety requirements (including turning circles and visibility splays) are maintained.
- To ensure the existing utility supplies have the capacity to cope with additional demands.
- To accurately assess the number of vehicles that could potentially use the site.

A design brief detailing the scope of the recommended design work is included in appendix 1&2.

A desktop assessment shows that the site should be able to accommodate at least 9 full size motorhomes plus 8 compact campervans within the existing parking areas.

A comparison of fees charged by other overnight stop-overs shows that prices range [REDACTED] depending on location and facilities.

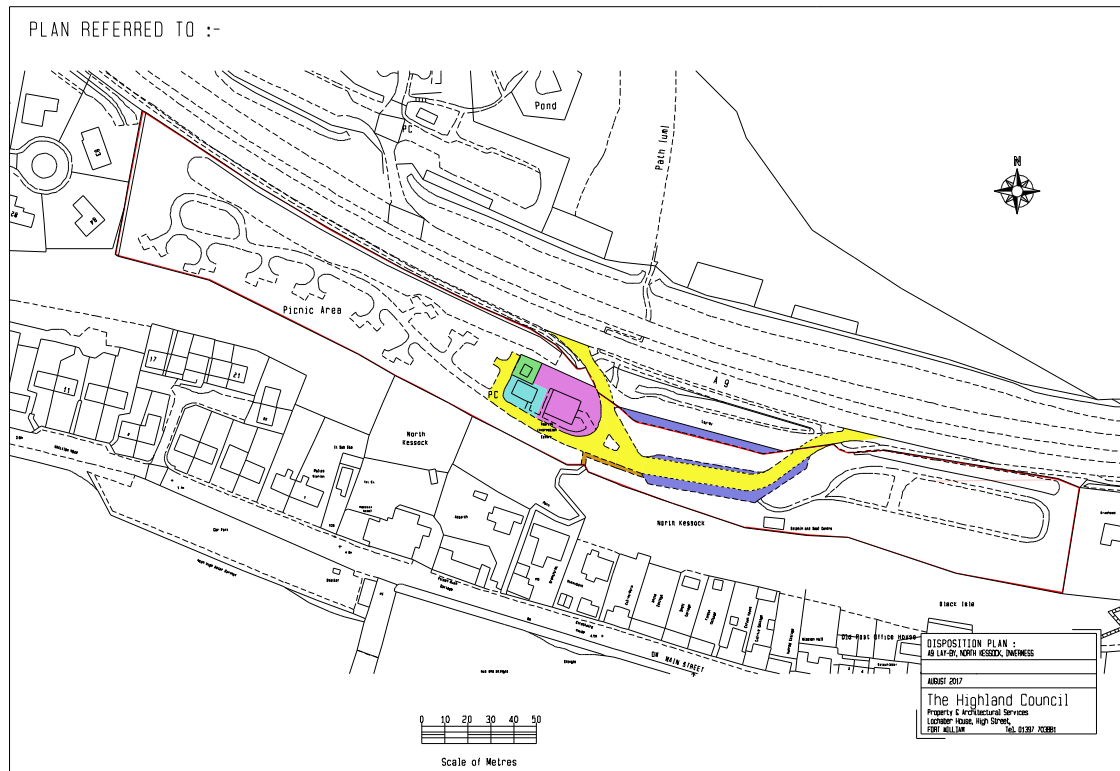
[REDACTED]

A review of potential methods for collecting overnight parking charges recommends that an honesty system using online payments or a donation point in the bakery is trialled initially, with the use of an ANPR system to be considered as a future development if the honesty system is unsuccessful.

A number of options for motorhome service point facilities are reviewed along with their approximate costs and suppliers.

Section 1 - Site assessment & potential phases of development

The following plan was provided by Ricky Cheng, Graduate Property Surveyor of the Highland Council and shows the extent of the North Kessock site within the red line boundary. Ricky also provided comments on some of the highlighted areas:



Notes regarding the areas highlighted in colour:

- The area in light blue refers to the public toilet;
- Purple refers to the former tourist information centre, now Harry Gows bakery & cafe;
- Green refers to a shed used by the Council's community service as storage;
- Yellow refers to the toilet/ shed/ Harry Gows/ general public right of access;
- Brown refers to public right of access (footpath leading down to the village);
- Royal blue refers to parking area which Harry Gows can use.

The suitability of the site at North Kessock for use as a motorhome stop-over and service point depends upon the space available for large motorhomes to manoeuvre and park safely.

The site is already used as a layby for vehicles heading North on the A9, and as such it is capable of accommodating all sizes of vehicles including large lorries. However, one of the design requirements is that the site must continue to be available for use by all A9 traffic, including customers of the on-site bakery and café.

In order to maximise the potential of the site and accommodate all of the potential users it is recommended that the site layout is professionally designed by a qualified engineer. This will ensure that criteria such as correct turning circles and visibility splays are given due consideration, as well as taking into account suitable connection points to the existing utilities on site – particularly the sewer connections which will need to be gravity fed.

The North Kessock site is at the top of a steep bank and parts of the site have very steep gradients which may prevent their use by vehicles. In order to assist the designer, it is recommended that a topographical survey is carried out prior to any design work.

An initial meeting was held on 1st March 2018 with Matt Bailey, Murray Bain, Ricky Cheng & Tim Stott of the Highland Council where it was suggested that the proposals for development of the North Kessock site be divided into phases. This would allow parts of the project to proceed more quickly and with minimal spending. The success of the early phases could then be assessed and used to inform the decision whether or not to proceed with the subsequent phases.

With this in mind, the project has been split into the following phases:

Phase 1 – Installation of a motorhome service point.

This phase will involve some construction costs, but this phase is key to the success of the project as it will provide the basic facilities required for the site to be used as a motorhome stop-over. Advice from Tim Stott of the Highland Council planning department is that the installation of a motorhome service point similar to the one in this sketch would not require planning permission provided there was no loss of green space or trees.



Phase 2 – Use of the existing parking areas as overnight parking bays

In addition to the parking spaces in the existing lay-by, there is also provision for some vehicle parking in the designated “picnic area” to the west of the site. The parking bays in the picnic area are quite small and it may be necessary to restrict the use of this area to smaller compact campervans (e.g. VW transporter & similar). The picnic area is currently closed off with a locked gate and height restriction barrier which would likely need to be removed to enable campervans to access this area.

Although a professional layout design is recommended to confirm the size and number of vehicles that could be accommodated for overnight parking, a desktop estimation using a scale drawing suggests that there could be space for at least nine motorhomes to park in the existing lay-by parking spaces and eight compact campervans in the picnic area. (This estimation still allows space for other cars and lorries to park in the layby closest to the carriageway).

Overnight parking is currently not allowed at the North Kessock layby. However, it is understood that this restriction can be lifted with the approval of the Highland Council Community Services Director.

Advice from Tim Stott was that the existing parking bays could be used for overnight parking without the need for planning permission.

Phase 2 will not require any construction, but there would be some costs associated with revised signage, revised road markings and the implementation of a system for collecting overnight parking charges.

Phase 3 – Redevelopment of the entire site to maximise the number of overnight parking spaces.

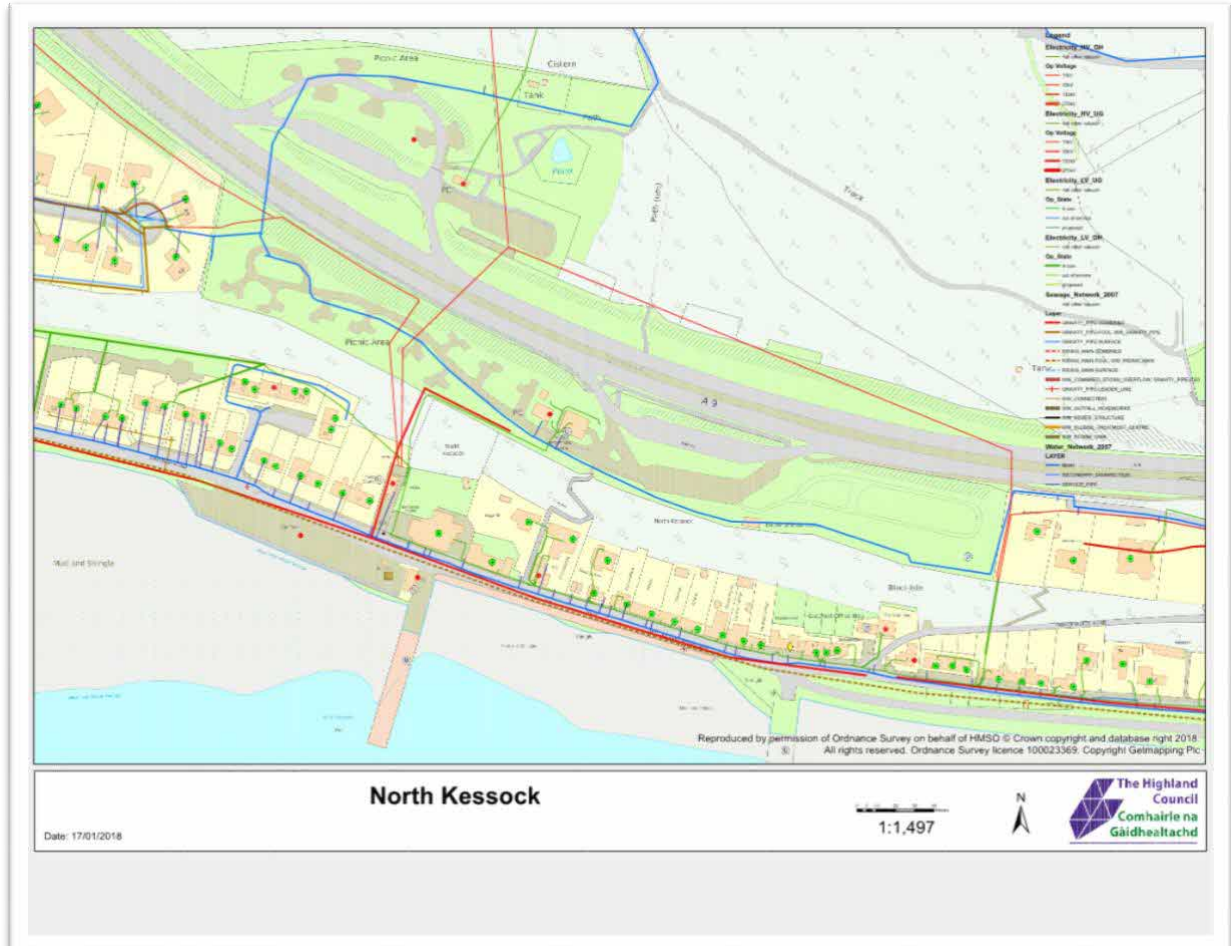
Following an assessment of the success of phase 1 and 2, redevelopment of the entire site can be considered in order to maximise the number of overnight parking spaces on the site. Consideration could also be given to further improvements to facilities in order to maximise potential revenue.

Design briefs for engineering deliverables:

Briefing documents for the topographical survey and the layout designs for phase 1-3 are included as appendix 1 & 2. Highland Campers Ltd have submitted a price for the production of these engineering deliverables, but it is understood that the Highland Council are also considering using their own engineering resources to progress these items.

Section 2 - Existing utility services and capacity

Highland council have provided the following diagram showing that the North Kessock site is already supplied with mains water, mains electricity and connections to the main sewer system.



It is assumed that there is a telephone line installed to the café/bakery building and that mobile telephone reception is good on all networks.

It is recommended that a utility capacity assessment is carried out on the site to ensure that the existing utility supplies have enough capacity to cope with the additional demands of this proposed development without reducing water pressure, overloading the power supply or overflowing the sewers. A brief for this assessment including the predicted additional demand, is included in the design brief in appendix 2.

Section 3 - Planning permission

At a meeting with Tim Stott from the Highland Council planning department, the following planning advice was given:

Planning permission would not be required for the installation of a motorhome service point, provided there was no loss of green space or trees.

Planning permission would not be required in order to enable overnight parking in the existing parking bays at North Kessock.

Planning permission would be required for development of overnight stop-over facilities in other areas of the site as this would be a change of use and loss of green space / trees. Planning applications for sites greater than 2 hectares usually take 7 months to determine, smaller applications under 2 hectares usually take 8 weeks.

Section 4 – Environmental considerations

A property enquiry certificate for the North Kessock site has been provided by Highland Council. It shows that the site does not have any special environmental or archaeological protection (see Appendix 4). However, there are areas of trees and green space on the site and so it is possible that some form of protected species survey may need to be carried out in order to gain planning approval for any development that impacted on these areas.

Toilet Chemicals and their potential effect on wastewater treatment systems:

Motorhomes and caravans are generally fitted with cassette toilets. These collect and hold the toilet waste inside a sealable container which can then be manually removed and carried to an emptying point. In order to help prevent odour, a range of toilet chemicals are on the market which can be added to the cassette. These chemicals can be divided into two groups:

Pro-biotic -These products typically use biological enzymes to break down the waste and reduce smells. These products are considered to be safe to use in all wastewater treatment systems including the small-scale septic tanks found on some remote campsites.

Biocidal – These products typically use formaldehyde as a biocide to kill the bacteria which cause the smells. Formaldehyde and other biocides could theoretically cause problems in small scale wastewater treatment facilities such as septic tanks by killing off the bacteria which break down the waste.

Toilet cassette capacity is typically between 15 – 20 litres and the concentration of biocide in a cassette when full would be in the region of 0.2%. Further dilution of the biocide will occur if the grey water tank is emptied at the same time as the toilet cassette. For example, if 50 litres of grey water were emptied at the same time as the toilet, the biocide would be diluted to just 0.004%.

A review was carried out in 2005 by Heidekamp and Lemley at Cornell University entitled “The influence of RV chemicals in marina or campground septic tanks” (appendix 3). This review states that:

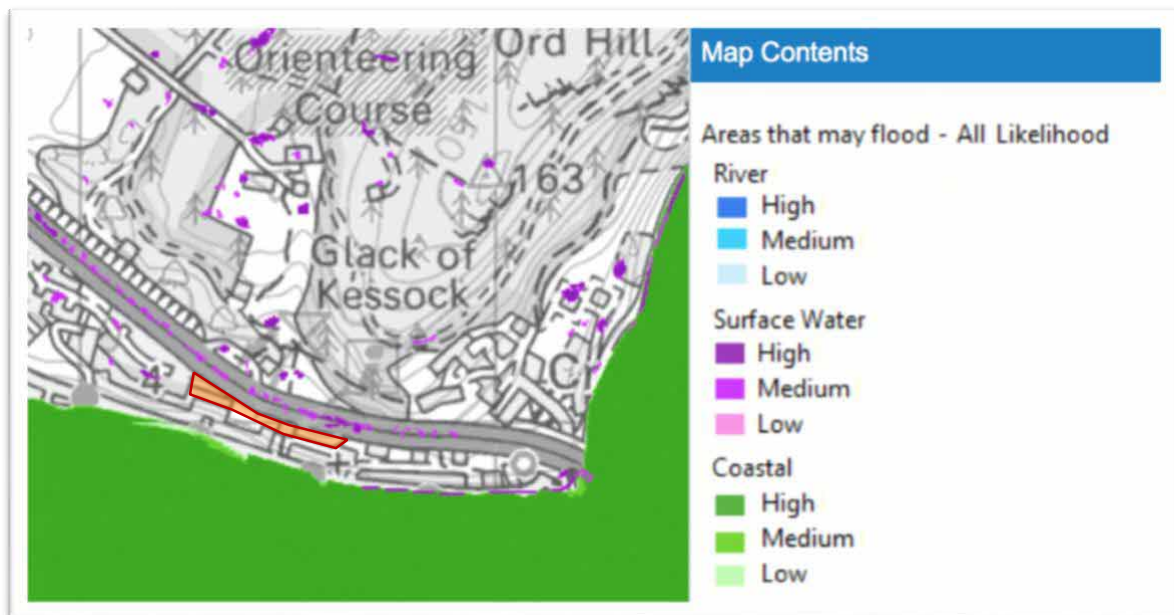
“Although these risks exist, a study by Novak et al. shows that campgrounds in Virginia (with seasonal occupation) show no signs of septic tank failure. And a study by Pearson et al. shows that a septic tank will have a lot of problems with large amounts of formaldehyde, zinc and phenol. But these large amounts are not realistic and the septic tanks still managed to go back to normal within 2 days.”

The North Kessock layby is connected to the main North Kessock sewer, which is pumped to Inverness and then onwards to the main Inverness wastewater treatment works at Allanfearn. By the time the wastewater from North Kessock reaches Allanfearn it will have been diluted many thousands of times and any traces of biocide that may remain will not pose any threat to the wastewater treatment process.

Section 5 - Flooding potential

The North Kessock layby site is approximately 40m above sea level (ref Ordnance survey 1:50,000 map). The following extract from the SEPA flood risk map shows that the North Kessock carpark (highlighted in orange) is out-with any of the areas deemed to be at risk of flooding.

Extract from SEPA flood risk map (North Kessock layby is highlighted orange):
<http://map.sepa.org.uk/floodmap/map.htm>



Section 6 - Neighbours and other potential stakeholders

Three residential properties share a boundary with the North Kessock site. These are No. 83 & 84 Drumsmittal Road to the West and “Braehead”, Old Craigton Road to the East.

There are over 30 residential and business properties to the south of the site along Main Street, but these are separated from the site, at the bottom of a very steep slope which is covered with mature trees and scrub.

Local business that may benefit from additional custom generated by the motorhome stop-over facility include the Harry Gow bakery & café on site; the Kessock Hotel and the North Kessock Village Store. An existing flight of steps leads down from the car park to the village hotel and store.

There is a caravan park at Coulmore Bay, 2 miles West of North Kessock along the coastal road. However, this site only appears to have static caravans for hire, with no spaces for touring motorhomes, so this business is unlikely to be affected by the development of a motorhome stop-over nearby.

The closest campsites offering space for touring motorhomes are Buncrew (6.2 miles away on the Beauly road), Ardtower (5 miles away in Westhill, Inverness), Dingwall (11 miles) and Fortrose & Rosemarkie (10 miles).

Section 7 – Requirements for a motorhome service point

The basic requirements of a motorhome service point include:

- A drain to empty toilet waste (black water disposal)
- A drain to empty wastewater from sinks and shower (grey water disposal)
- A tap to refill water tanks with fresh water
- Bins for disposal of general waste & recycling

Toilet waste (black water) disposal systems:

There are generally two types of toilet waste disposal systems on motorhomes. The most common system in the UK uses a sealed cassette which can be removed from the motorhome and carried to a disposal point.



The toilet waste disposal point needs to be connected to the sewers so that the toilet waste is carried away to a suitable wastewater treatment facility.

Larger motorhomes (particularly American RV's), sometimes have an on-board tank which is emptied via a 3" hose. The hose needs to be fed into a sewer connection point at ground level, located reasonably close to the motorhome. There is no standard length for this type of hose. Most are sold in lengths of 15 or 20 feet (approx. 4.5 or 6m).



Grey water disposal systems:

“Grey water” is the term used to describe wastewater from the sinks and shower (i.e. not toilet waste).

In the UK, motorhomes generally have a grey water waste tank which can be drained from a tap underneath the vehicle. A drive-over drain covered by a grating and connected to the sewer system is ideal for receiving this type of wastewater.



There is no standard size or position for motorhome drain taps, so a large drain covering the entire width of the parking bay is ideal in order to suit all the vehicles that might use the facility.

A water supply for flushing drains and toilet cassettes is a useful facility at a wastewater disposal station. This is normally a separate tap to that used for freshwater to avoid any risks of cross-contamination.

Fresh water tap:

The fresh water tap for refilling the motorhome fresh water tanks should be labelled in such a way that users understand which tap to use for which purpose. Motorhomes will typically carry a length of garden hose in order to re-fill their water tank and a standard garden tap is the most common design of tap that is provided on most camp sites.



230volt mains electric hook-up points:

The majority of motorhomes, caravans & campervans have the facility to connect to a 230volt mains electricity supply via a 16amp 'hook-up' cable fitted with a 3pin 16amp plug.

Most vehicles also carry a leisure battery and LPG (liquefied petroleum gas) designed to allow the vehicle to be used without needing to connect to a 230volt electricity supply, but a mains hook-up facility is useful for longer stays and owners are prepared to pay a premium to use it.



Once connected, the mains electricity can be used to power a range of facilities inside the van such as a battery charger; fridge; heating; air conditioning; hot water; cooker; kettle; TV & lighting.

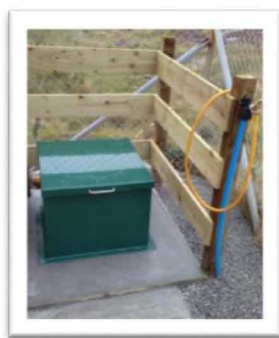
The campsites listed in table 2 charge [REDACTED] extra per night for electricity.

A 230volt mains hook-up facility is not an essential service for an overnight stop-over and service point, but if the site at North Kessock were to be developed in the future, then electric hook-up points would increase the potential revenue that the site could generate.

Section 8 - An overview of some commercially available service point systems:

CTDP:

This UK based company manufactures stand-alone chemical toilet disposal points made from fibreglass. They have to be connected to a sewer system and need a freshwater supply for flushing. They are available from <http://www.ctdp.co.uk> for the standard version and a flushing version. They are only suitable for disposing of waste from chemical toilet cassettes – they are too tall to accept waste from fixed drainage points underneath a motorhome and so would need to be used in conjunction with a drive-over drain.



Dockstop:

Dockstop units are manufactured in Serbia by Eksal. The units are made to order and can be built to customer requirements with options to provide: toilet cassette & 3" waste hose disposal, waste water flushing, fresh water supply and electric hook-up points, all contained within a robust stainless-steel tower which is available with a frost protection heater, and an option to allow it to be coin operated.

The company web site is www.dock-stop.com.

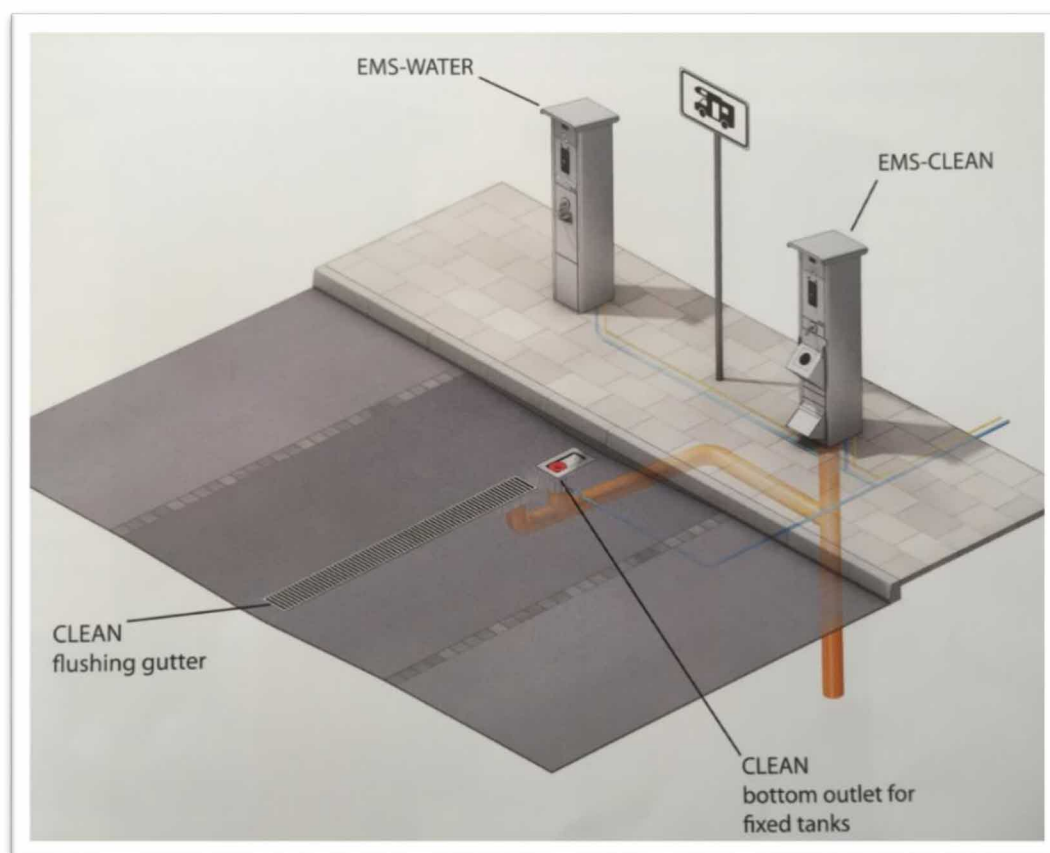


Beckmann:

Beckmann are a German manufacturer and supply a range of stainless steel towers - one to supply water, one to deal with wastewater disposal and one for power supplies.

The units can be specified with frost protection and can be coin or credit card operated if required. The company website is www.beckmann-gmbh.de.

The diagram below shows how these products could be set up to provide a fully integrated motorhome service point.



RMCS:

RMCS are a UK company based in Lincolnshire. They manufacture and supply a range of service bollards for campsites. These bollards tend to be designed primarily for 230volt electric supplies (although some are also fitted with water taps). These products are more suited to installation on individual campsite pitches, rather than for use as a motorhome service point.



Section 9 - Options for charges and payment solutions

In order to realise some return on the investment in developing the North Kessock carpark as a motorhome stop-over, it will be necessary to levy some sort of charge on users of the facility.

The stop-over will provide two services which could potentially be charged for – overnight parking and water / wastewater at the service point.

Service point charges:

Two manufacturers have been identified who can supply integrated water / wastewater service points with options for coin or card payments if required.

Wastewater disposal charge:

While this is a potential source of income and is possible to achieve with a coin or card operated service point, advice from a manufacturer (Beckmann) is that charging for wastewater disposal is not advisable as there will be a temptation for some users to avoid the charge by dumping their waste into alternative areas (bushes, road drains etc). For this reason, it is recommended that wastewater disposal is provided free with the opportunity for users to make a voluntary donation.

Water filling charge:

This is also an option provided by one of the service point manufacturers where a coin selector can be used to activate the freshwater taps.

One of the problems with charging for water fills is the low unit cost of water which limits what customers will be prepared to pay. Scottish Water currently charge around 8pence per 100 litres (Scottish Water web site 14/3/18). While motorhome users are likely to be prepared to pay a premium (possibly a few pounds) for the convenience of being able to fill up with water, the potential income from a coin operated tap would need to be weighed carefully against the cost of emptying and managing the money. Furthermore, a coin operated machine may become a target for vandals. There is an option for a payment unit that will accept card/contactless/mobile payments, but this would need to be provided by a third-party operator and the cost of this service is likely to outweigh the potential income from a low-priced commodity such as water.

Bearing in mind these points, it is likely to be more cost effective to provide the water and wastewater facilities for free (possibly with the option for honesty donations) and charge a fee for overnight parking instead.

Overnight parking charges:

Motorhome users will be well accustomed to paying a reasonable fee for overnight parking, especially if there are some facilities provided. Table 1 & 2 compares the prices charged by local campsites and other stop-over sites around Scotland.

Site name	Location	Price	Payment method	Electric hookup	Toilets	Showers	Wastewater	Water	Website:
Glencapel Harbour, Dumfries	DG1 8RE		Donations in honesty box		x			x	https://www.searchforsites.co.uk/markerMobile.php?id=22771
West Harris Trust Camping Spots, Luskentyre and Shielbost	Isle of Harris		Pay by paypal via website or donations box - (honesty payment)						http://www.westharristrust.org/camping/camping/
Port Errol Harbour, Cruden Bay	AB42 0HF		Suggested donation in honesty box					x	https://www.searchforsites.co.uk/marker.php?id=22137
Shader, Barvas, Isle of Lewis	HS2 0RH		Pay to owners on site only 2 spaces, can be booked.	x	x		x	x	https://www.visitscotland.com/info/accommodation/hebrides-campervan-overnight-parking-p1583611
Falkirk Wheel	FK1 0RS		Pay at shop & collect key for facilities		x				https://www.scottishcanals.co.uk/falkirk-wheel/plan-your-visit/find-us/
Loch Clash Pier, Kinlochbervie	IV27 8RR		Pay at SPAR shop	x	x	x	x	x	https://klbcompany.wordpress.com/loch-clash-stopover/
Trossachs Pier, Loch Katrine, Stirling	FK17 8HZ		12 spaces, pay at shop on site, booking advised	x	x	x	x	x	https://www.lochkatrine.com/accommodation/motorhomeparking/
West Harris Trust Old School, Seilbost	Isle of Harris		only 2 spaces bookable online in unmanned site	x				x	http://www.westharristrust.org/camping/campervans-2/

Table 2: Campsite prices for overnight stay in a motorhome or caravan (Prices as advertised March 2018)

Site name	Postcode	Highest price (peak season)	Lowest price (off peak)	Extra cost for electric	Highest price including electric	Website:
Faichemard Farm Campsite, Invergarry	PH35 8HG					http://www.faichemard-caravancamping.co.uk
Bunroy Park, Fort William	PH31 8AG					https://www.bunroypark.co.uk
Auchnahillin Holiday Park (Daviot)	IV2 5XQ					http://www.auchnahillin.co.uk
Bught Park Caravan Park	IV3 5SR					http://www.invernesscaravanpark.com
Fortrose Bay Campsite	IV10 8RX					http://www.fortrosebaycampsite.co.uk
Bunchrew Caravan Park	IV3 8TD					http://www.bunchrew-caravanpark.co.uk
Beauly Caravan Park	IV4 7AY					http://www.beaulyholidaypark.scot
Ardtower Caravan Park, Inverness	IV2 5AA					http://www.ardtower-caravanpark.com

(For ease of comparison, the above list only includes sites which charge per motorhome. Other sites advertise prices per person rather than per vehicle.)

Based on the desktop estimation of 17 overnight stop-over spaces (9 motorhomes & 8 campervans)



It is important that signage regarding charges also includes a brief explanation of how the funds will be used (i.e. to improve facilities at this site or to help develop other sites). This can have a very positive impact on the user's perception of the site and the local area they are visiting.

This sign used by the West Harris Trust refers users to their web site and a leaflet which explains how the money is spent to maintain the area.

Charging structure:

Any charging structure would need to suit the circumstances at North Kessock in order to allow motorists a period of free parking to rest on their journey, or visit the on-site bakery.

An example of a charging structure that may be appropriate at North Kessock:

Free parking between 06:00 and 21:00

Free parking for up to 1hr between 21:00 and 06:00

Overnight parking charge applies between 21:00 and 06:00 for stays greater than 1hr.

It could also be possible to request a donation for anyone using the stop-over facilities but not actually staying overnight. Many campsites offer a pit-stop service and suggest a donation towards the maintenance and improvement of the facility. This could provide an additional revenue source for the North Kessock stop-over and could be collected in the same way as parking charges.

There are a number of options for collecting payment of overnight parking charges:

ANPR camera monitoring systems:

Automatic Number Plate Recognition (ANPR) systems are commonly used to manage parking payments. Cameras located at the entrance and exit points of the carpark log arrival and departure times, and a charge can be levied according to the length of stay.

Payment for parking can be made online, by mobile phone or over the counter at a nearby shop. The ANPR system matches payments to vehicles, and any that have not paid are sent a penalty charge to the registered address of the vehicle. The ANPR system is usually set up and operated remotely by a specialist company (e.g. ParkingEye.co.uk). However, these systems are often unpopular with users and there have been a number of negative press reports about the working practices of the companies who operate them.

Pay & display ticket machine:

This is a common method for collecting payments in carparks. It relies on attendants to maintain ticket machines, check tickets, note down non-payment offenders and follow up with penalty charges. For a pay and display system to be properly effective at an overnight stop-off, the attendant would need to carry out checks on vehicles during the night or early hours of the morning.

Honesty payments:

Several stop-over sites rely on honesty payments. When positive signposting is used to explain why payment is requested, such as to improve the infrastructure and develop/maintain a site, the response can be very positive.

Some honesty systems have cash donation boxes which need regular emptying and could be a temptation for vandals, but many sites also have internet based donation pages, allowing visitors to go online and make a quick payment.

Overnight parking permits sold at a local shop:

Some overnight stop-over sites have teamed up with a local shop to sell parking permits (such as the Kinlochbervie Spar shop which sells permits for Loch Clash Pier). This has benefits for both parties as the shop is likely to benefit from increased footfall and sales. There is potential for an arrangement of this sort to be set up at North Kessock with permits being sold at the Harry Gow café & bakery which is located on site.

Recommendation:

In the case of North Kessock, an initial system to allow stop-overs to make a payment in the Harry Gow café or on-line if the café is closed could be an ideal starting point and would have low set-up costs. Monitoring of the system to assess the actual vs expected financial return will indicate whether an honesty system works well at this site. If not, then a more enforceable system such as ANPR may need to be considered.

Appendix 1 – Topographical survey brief

North Kessock Motorhome Stop-over Development Brief for conducting a Topographical Survey

The site is the North-bound carpark on the A9 at North Kessock (see attached plan).

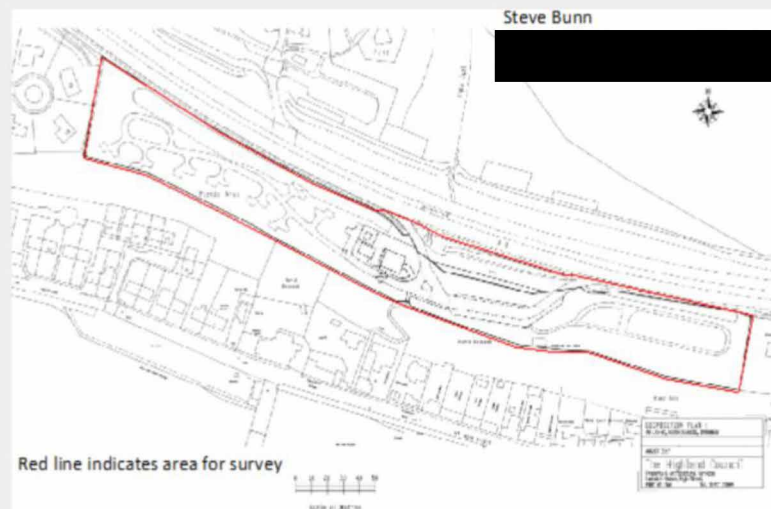
We are working with Highland Council to investigate the potential for installing motorhome parking and water filling / wastewater emptying services at this site.

The survey should pay particular attention to the locations of all the utility services currently on site (power, water, wastewater & surface water) including all the access points to the existing underground services, and where possible the access covers should be lifted by the surveyor and the depth and type of service identified.

The planning department will be interested in assessing any loss of green space and trees, so the survey will need to pick up and define these areas. Any significant individual trees should be surveyed, but there is no need to survey every single tree and bush - there are areas of scrub and small trees which can just be shown as an outline.

Kerb heights and road widths, especially at the entrance and exit points will be important.

There is no need to survey the heights or internals of the existing buildings.



Appendix 2 – Design brief for utility assessments and layout drawings:
North Kessock A9 Parking Area
Motorhome stop-over and service point development

Introduction:

The North Kessock parking area is located at OS grid reference NH 655 479, just off the A9 north-bound carriageway.

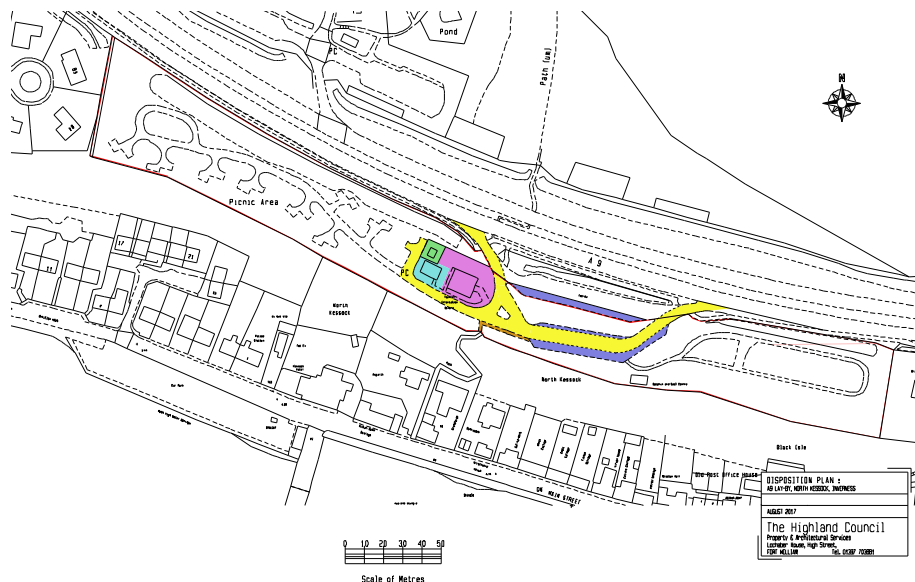
A feasibility study is being carried out to determine if this area could be suitable for use as a stop-over & service point for motorhomes, caravans & campervans as they tour the Highlands.

The service point will have facilities to allow tourists to empty the wastewater and toilet tanks on their vehicles, and also refill their fresh water tanks. Refuse bins will also be provided.

The stop-over facility will be intended to provide areas in which campervans and motorhomes can be parked for an overnight stay. (It is not intended to be a long-stay campsite).

In addition to the proposals for overnight parking bays, the North Kessock carpark will continue to be used as a stop-off and rest area for cars and lorries travelling North on the A9. There is now a new bakery and café located in the old tourist information building on the site.

The attached plan shows the site and areas which are currently committed:
(This plan is also available as a .dwg file)



- The area outlined in RED is under the Highland Council ownership and open for discussion.
- The area in PURPLE contains the layby and the public toilet (LIGHT BLUE) which must continue to be accessible to the public and other road users (not just motorhomes).
- The public will have right of access through the area outlined in YELLOW.
- The former tourist information (PINK) is owned by a private entity and leased to Harry Gow on a 10-year lease.

Engineering deliverables:

The following engineering deliverables will be required as part of the feasibility study:

1 - Utility capacity assessment:

To review and assess the capacity and current demands on power supply, water supply & wastewater drainage, then determine whether there is capacity to support the following additions:

Freshwater supply:

2no external freshwater taps for refilling motorhome water tanks. Tanks hold up to 100L of water and are typically filled via a ½” garden hose. Peak use at busy times could be one tank fill every 15 minutes.

1no external tap for rinsing wastewater tanks and chemical toilet cassettes.



Wastewater drainage:

Capacity to accept up to 100L of wastewater draining through a 3” outlet. Peak use at busy times could be one tank drain every 15 minutes.

(Some larger motorhomes use a 3” hose connection to drain their waste tanks into a pipe as shown in the upper photograph. This system deals with both toilet waste and wastewater from the sinks and shower. However, most motorhomes in the UK have a simple drain tap underneath the vehicle which is more suited to draining into an open grating. This type of system only drains ‘grey water’ from the sinks and shower, the toilet waste is collected into a separate cassette which can be removed and carried to a special disposal point).



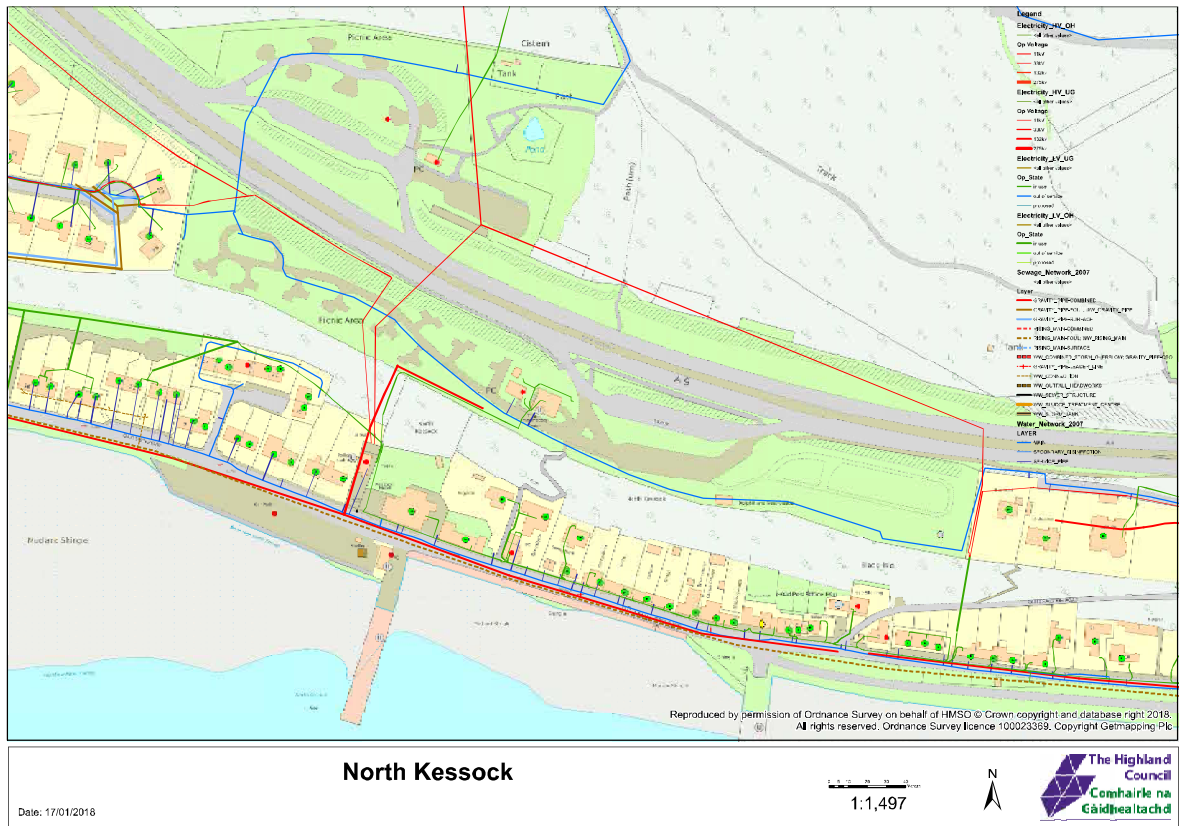
Power supply:

The number of additional 16-amp power supply connections that could be added to the site (up to a maximum of 60).

The number of additional 10-amp power supply connections that could be added to the site (up to a maximum of 60).



The following plan has been provided by Highland Council which shows the utility connections to the site:
 (This plan is available as a .xps file if required).

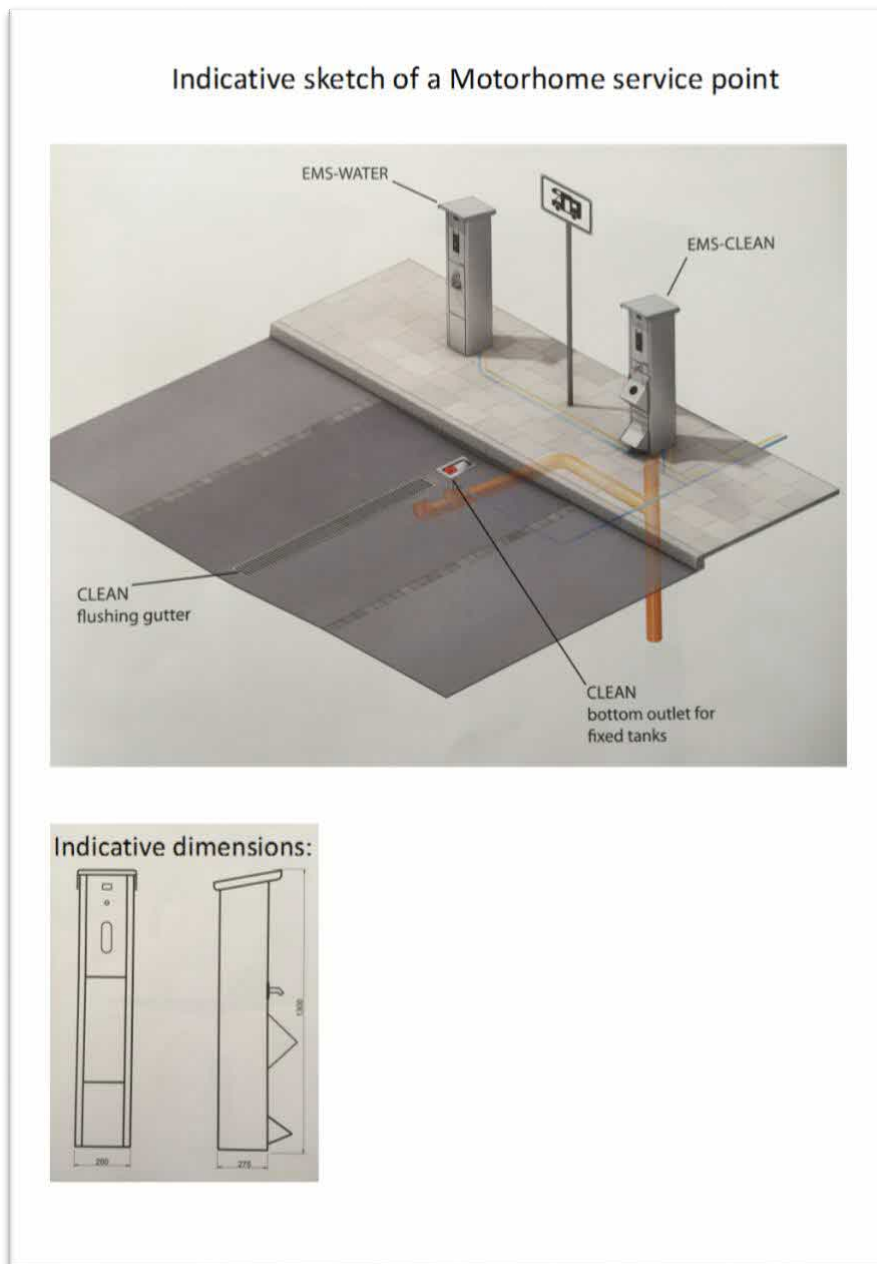


2 – Layout drawings:

We are considering a phased approach to the development of a motorhome stop-over facility at North Kessock and will require three layout drawings – one for each phase.

Phase 1 – installation of a motorhome service point.

The motorhome service point will be an area where a large motorhome can be parked while the wastewater tank and chemical toilet cassette are emptied and the fresh water tanks are refilled. It is likely that a proprietary service point will be used as detailed in the sketch below:



The motorhome service point needs to be accessible for large motorhomes. The maximum size for motorhomes in the UK is 12m long by 2.55m wide. Vehicles up to 2.55m wide are common, but vehicles more than 8.5m long are unusual. Common motorhome chassis dimensions including wheel base and rear overhang are attached to this document as appendix A.

It is envisaged that a motorhome will only park at the service point for the time it takes to drain and refill the tanks. The vehicle will then vacate the service point and move to another parking space for a longer stop-off, or leave the parking area and continue on its journey.

It is likely that other motorhomes will arrive at the parking area while the service point is in use. Therefore, there must be a system to allow motorhomes to wait in a parking bay, and then move to the service point once it has been vacated.

A traffic flow system needs to be devised in order to allow large motorhomes to move to and from the service point without the need for excessive or intricate manoeuvres and without obstructing or endangering other vehicles and pedestrians using the site. A one-way system which avoids the need for reversing would be ideal.

Phase 2 – Utilising the existing parking areas for overnight stop-overs for motorhomes and caravans.

This stage allows the concept of an overnight stop-over site to be tested with minimal development costs. The ‘No Overnight Parking’ restriction would be lifted and a system for selling overnight parking permits would be introduced.

Layout drawings for stage 2 should include all of the development proposed in stage 1, plus an assessment of the number of overnight parking bays that could be achieved within the existing parking areas.

Space required for parking bays:

Standard bays suitable for the majority of motorhomes:

Standard pitch sizes on camping sites are usually 8m long x 5m wide. This allows space for most sizes of motorhome with an awning pitched alongside.

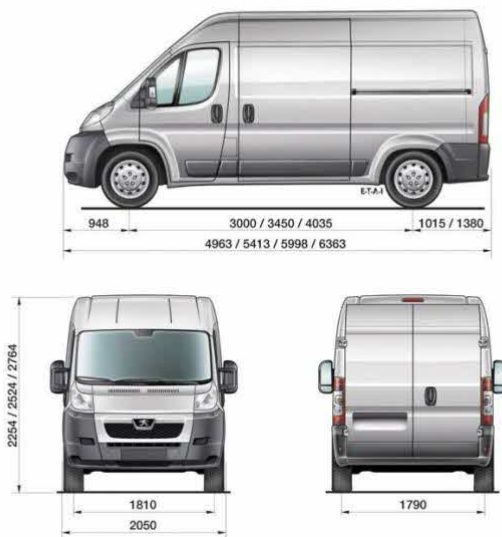
In the case of an overnight stop-over site where it is unlikely that awnings will be used, this standard pitch size might be considered too wide. A reduced width of 4m might be considered more appropriate. This would still allow an average separation of around 1.5m between vehicles.

Consideration should also be given to space that could be used by caravans with their tow cars and extra-large motorhomes over 8m long. In the case of touring caravans, the maximum size allowed on UK roads is 7m long by 2.55m wide, (excluding the towing A-frame which adds approximately 1m to the length). Due to the difficulty of manoeuvring a caravan into a perpendicular parking space and the additional length required to accommodate the tow car, it would be preferable to direct caravans (and extra-large motorhomes) to a parking area parallel to their direction of travel where they can drive straight in and out without the need for reversing manoeuvres.

Picnic area – potential for smaller bays suitable for compact campers:

The area currently shown on the plan as a picnic area may well be unsuitable for larger motorhomes in its current layout. However, there are many compact campervans that might be small enough to use this area. Compact campervans are typically based on vehicles similar to the Volkswagen T5 and the Fiat Ducato panel van. The dimensions of these vehicles are shown below. The picnic area should be assessed to determine if it is suitable for use by full size motorhomes, and if not, then consider the number of compact campervans that could be accommodated in this area in its current layout.

Fiat Ducato dimensions of model range:



VW Transporter dimensions – long & short wheelbase:



South West grass area – not to be considered as part of phase 2:

The area of ground to the South West of the site (adjacent to the old Dolphin watching centre) is currently grass. The path shown on the plan is no longer discernible. Vehicle access to this area is currently blocked by an earth bund. Any development of this area to create additional parking spaces would require planning permission and so this area should not be included in the phase 2 plan.

Phase 3 – Re-development of the entire site to maximise the number of camping pitches available:

In this phase, planning permission would be sought in order to develop the entire area to maximise the number of motorhome spaces. At this stage, an indicative layout plan showing the potential number of motorhome spaces that could be achieved on the site is all that is required. This layout plan will be used to inform an economic assessment of development costs vs potential return on investment.

For this assessment, the standard motorhome pitch size of 8m x 5m should be used as it is likely that this phase of the development would be used for stays longer than one night, and so the extra space will be more important.

Indicative locations for electric hook-up points should also be considered. (A standard 16-amp caravan hook-up cable is 25m long, so it is usually possible to serve 4 pitches from a single bollard fitted with 4 separate power outlets).

Ideally the motorhome service point established in phase 1 will remain in the same location.

In areas of the site where the standard 8m x 5m pitch size is impractical, it will be acceptable to propose narrower pitches for overnight stop-overs, and/or smaller pitches restricted to use by compact campervans.

Topographical survey:

A new topographical survey will be commissioned and the survey outputs provided to enable the design of the layout drawings.

Summary of engineering deliverables required:

Utility assessments for power, water supply and wastewater drainage.

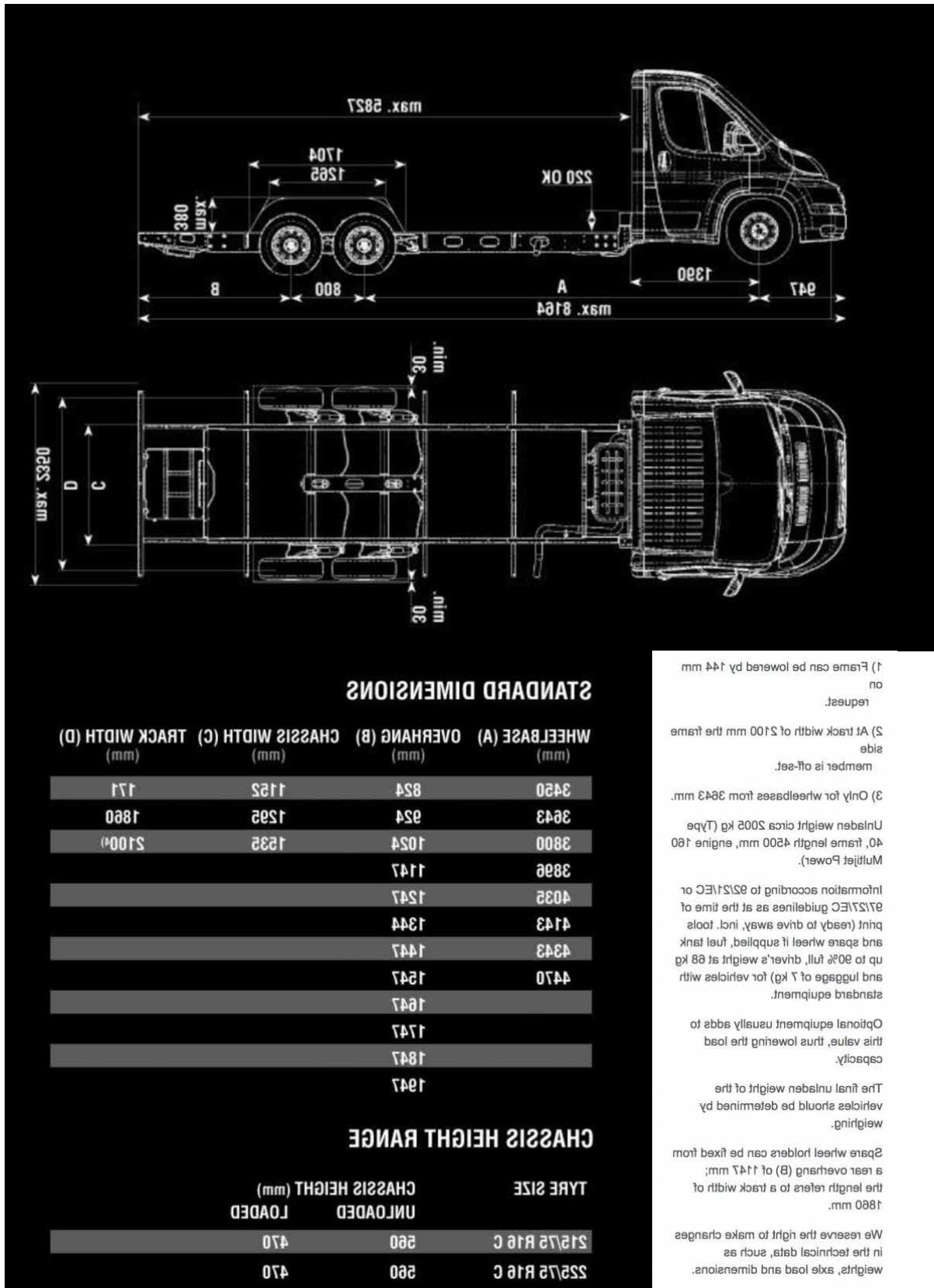
Phase 1 layout plan (motorhome service point location and traffic flow system).

Phase 2 layout plan (Phase 1 layout plus assessment of number of overnight parking spaces available within existing parking areas).

Phase 3 layout plan (Re-development of entire site to maximise the number of motorhome spaces available).

Design Brief Appendix A:

Typical motorhome chassis dimensions (source: AL-KO.co.uk)



Note: Row 1 of Standard Dimensions - Track Width of 171mm is likely to be a typo – this dimension is more likely to be in the order of 1710mm.

WATER BULLETIN

Water Quality Program, College of Human Ecology, Cornell University

The influence of RV chemicals in marina or campground septic tanks

Annelies J Heidekamp and Ann T. Lemley
January 2005

Chemicals to reduce smells coming from either boat or RV holding tanks can be of influence on the delicate bacteriologic balance in a septic tank on a campground or at a marina. Therefore it is important to choose the chemical with the least influencing effects. But what are the chemicals to mind and what are the safety measures to take?

The chemicals used

Over the years a number of different chemicals have been used. Formaldehyde, para-formaldehyde, and quaternary ammonium are the most important known active species. In table 1 the different ingredients are shown:¹

Although most of these ingredients are biodegradable if diluted properly, they have been proven to be a nuisance, especially when an RV tank is emptied when only half-full. The dosage of the de-odorizing agents that is shown on the label is for a full tank. When a tank containing less is emptied, the concentration of chemicals is higher. This makes it more difficult for the septic tank bacteria to cope.

Another problem with the chemicals mentioned in the above table is that fact that they can also be a threat to human health. Formaldehyde is a good example. In the MSDS (Material safety datasheets) it is mentioned that it is poisonous when ingested and can cause burns on the skins. Although formaldehyde is diluted (to 37%) in the final product, it is still something that can give grave irritation

Table 1. Active ingredients you should avoid using in your RV holding tank deodorizers.

Active Ingredient	Threats to Human and Environmental Health
Bronopol (chemical name: bromo-nitropropane-diol)	bacterial pesticide
Dowicil (chemical name: 1-(3-chlorallyl)-3,4,7-triaza-1-azoniaadamantane chloride)	bacterial pesticide (EPA states "Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority.")
Formaldehyde (also known as Formalin; degradate of bronopol)	kills or retards bacterial growth, recognized by EPA as probable carcinogen ¹ ; moderately toxic to humans ²
Glutaraldehyde (also known as embalming fluid)	Retards bacterial growth and covers sewage odor, eye/inhalation irritant
Paraformaldehyde (polymerized formaldehyde)	very toxic to humans ³ (see formaldehyde)
Para-dichlorobenzene (common ingredient in mothballs, urinal cakes, and toilet bowl fresheners)	known carcinogen ¹ and drinking water contaminant; moderately toxic to humans ³

¹ a carcinogen causes cancer

² lethal dose for 150 lb person is between 1 ounce to 1 pint

³ lethal dose for 150 lb person is between 1 teaspoon to 1 ounce

The manufacturers

There are a great number of manufacturers for RV chemicals.² Almost all different products say that they are 100% biodegradable. As active species only formaldehyde and enzymes could be found on the current products. The important thing for a consumer to do is read the label. Only then can you make sure if any of the above mentioned active species are present.

The influence on septic tanks

The result from these chemicals in septic tanks can be threefold:³

1. The degradation process in the septic tank can be slowed down to the point that the sludge contents will increase and a larger risk exists of overflow of solids into the drain field.
2. If the concentration of the product chemicals is too high, it can reduce the drain field's ability to degrade waste.

The toxic chemicals might migrate from the drain field to the groundwater.

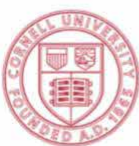
Although these risks exist, a study by Novak et al.⁴ shows that campgrounds in Virginia (with seasonal occupation) show no signs of septic tank failure. And a study by Pearson et al.⁵ shows that a septic tank will have a lot of problems with large amounts of formaldehyde, zinc and phenol. But these large amounts are not realistic and the septic tanks still managed to go back to normal within 2 days.

Conclusions

- Only full tanks should be emptied in septic tanks
- Read the label on the de-odorizing product carefully for the presence of active species
- Follow the directions for applying the product to your tank.
- When in doubt ask the campground/marina owner what kind of de-odorizer you should use.

References

1. University of Arizona fact sheet on "RV holding-tank treatments and de-odorizers in septic systems" <http://ag.arizona.edu/pubs/water/az1233.pdf>
2. Several sellers' sites: www.thetford.com, www.odorlos.com, www.valterra.com, www.dyersonline.com, www.jcwhitney.com
3. "Effects of deodorants on treatment of boat holding-tank waste" Walker WR, Haley CJ, Bridgeman P, Goldstein SH.; *Environmental management* 15 (3): 441-449 MAY-JUN 1991
4. The effect of boat holding tank chemicals on treatment plant performance" Novak, J.T., McDaniel, C.R., Howard, S.C.; *Research journal of the water pollution control federation* 62(3), 288-295 (1990)
5. Pilot scale septic tank treatment of preservative-laden waste " Pearson FH, McLean HR, Klein SA; *Research journal of the water pollution control federation*, 63 (7): 999-1011 NOV-DEC 1991



Cornell University
Cooperative Extension

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Appendix 4 – Property enquiry certificate



HPS

PROPERTY ENQUIRY CERTIFICATE

Date: 01 February 2017 Our Ref: 17/ A205
 Your Ref: AFD
 SUBJECTS: TOURIST INFORMATION CENTRE CAR PARK NORTH KESSOCK
 IV1 3UB

1. Relevant Zoning in current Development Plan:-
 Existing use-No Change Proposed
In considering development proposals, the Council will have regard to the likely impact upon important features of interest and/ or the potential risk to the public. The Council will only approve development if there are no significant effects on heritage, amenity, public health & safety interests. Subject of Planning Permission 14/ 02468/ FUL - Temporary siting of catering van/ trailer. Note: The Tourist Information Centre is subject of Planning Permissions - Change of use from tourist information point to bakery and takeaway & Erection of signs.
2. Are subjects affected by any Notices or Orders under the Town and County Planning (Scotland) Acts including

(a) Listed as being of Special Architectural or Historic Interest?	No
(b) Situated in a Conservation Area?	No
(c) Affected by Article 4 Direction?	No
(d) Affected by Tree Preservation Order? <i>Southern boundary adjoins TPO.</i>	No
(e) Affected by a Stop Notice?	No
(f) Affected by an Enforcement Notice?	No
(g) Affected by Waste Land Notice?	No
(h) Affected by location of an Ancient Monument?	No
3. Are subjects affected by any Planning Scheme at present promoted by the Planning Authority? No
4. Are the carriageway/ footpath/ verge ex adverso / serving the subjects taken over and maintained by the Roads Authority? Yes
A9(T) only
5. Are the subjects likely to be affected by any major road improvement schemes? No
6.

(a) Is there a public sewerage pipe maintained by the appropriate authority ex adverso / serving the subjects?	Yes
(b) Is the property connected to the sewer?	Yes
(c) Is Non Domestic Sewerage Charge payable?	Yes
7.

(a) Is there a public water supply maintained by the appropriate authority ex adverso / serving the subjects?	Yes
(b) Is the property connected to the water supply?	Yes
(c) Is Non Domestic Water Charge payable?	Yes

Appendix 5 – Income, Expenditure and Timescale estimates:

Estimated income from an overnight motorhome stop-over at North Kessock:

Annual income has been calculated based on figures from the “Scottish Accommodation Occupancy Survey Annual Report 2016” (available on the Visit Scotland website) which shows that campsites had an average occupancy rate of 44% for the 7 months (214 days) from April to October:

(Annual income = price per night x parking capacity x 214 x 0.44)

	Price per night	Overnight parking capacity	Annual income
Phase 1 & 2		17	
Phase 3		30	

The following assumptions have been made:

Overnight parking capacity is based on a desk-top estimate.

Price per night is based on average stop-over prices around Scotland (phase 3 includes a premium for electric hook-up facilities).

Estimated expenditure:

Feasibility study	
Design & Topo survey	
Service point unit	
Construction costs	
Signage	
Total (Phase 1&2)	
Additional cost for Phase 3	
Total (phase 1,2,&3)	

Estimated timeline – 5 weeks for completion of survey & layout drawings:

The following table shows an estimated timeline of 5 weeks for the production and completion of the topographical survey, design and layout drawings for the North Kessock stop-over site.

This timeline is based on estimates given by the surveyors and consultants at the time of quotation. Lead times and durations may change depending on the workload of the teams at the time of commissioning the work.

Week	Topographical Survey	Layout drawings
1	Commission surveyors	Commission consultants
	Lead time to start – 1 week	Lead time to start – 2 weeks
2	Survey work on site – 2 days	
	Report production – 1 day	
	Topo survey complete	
		Topo survey delivered to consultants
3		Consultants start on design & layouts
		Estimated duration - 2 weeks
4		
5		Design & layout drawings complete

Estimated timeline of 22 weeks for installation of a motorhome service point (Phase 1):

Week	Design	Construction	Procurement	Highland Council
0				Approve survey & design work
1	Commission survey & design consultants			
2				
3	Topo survey complete			
4				
5	Design & Layout complete			
6				Approve design & proceed to construction
7		Prepare construction scope for pricing		
8		Scope to contractors for pricing		
9				
10		Contractor prices & timescales reviewed		
11				Approval for construction
12		Commission contractor	Order service point	
13		Lead in to start on site		
14				
15				
16				
17		Start on site	Service point delivered	
18				
19				
20				
21		Construction complete		
22				Project acceptance & handover

This timeline is based on high level estimates and assumptions.

Actual timescales will vary depending on contractor availability.
It is assumed that the proposed design will not require planning permission (i.e. there will be no loss of trees or green space).
It is recommended that this timeline is reviewed and updated at each approval stage.

Version History:

Version:	Date Issued:	Summary of changes:
1	27/3/2018	
2	8/4/2018	Added appendix 5 – cost & timescale estimates